

DETAILED ACTION

Response to Amendment

Applicant's amendment to the claims filed March 24, 2008 has been entered. Claims 1, 2, 5-8, 11, 22 and 23 are currently amended. Claims 25-27 are new. Claims 3, 4, 9, 10, 12-21 and 24 have been canceled. Claims 1, 2, 5-8, 11, 22, 23 and 25-27 are pending and under examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 2, 5-8, 11, 22, 23 and 25-27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims recites "and derivatives and substituents thereof". There does not appear to be support for this limitation in the original disclosure. This rejection may be overcome by deleting the limitation or by pointing to the location in the original disclosure where support for the limitation for the recited polymers may be found.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 25 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

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applicant regards as the invention. Claim 25 depends from claim 24 which has been canceled.

For the purposes of examination, claim 25 is understood to depend from claim 22.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Liaw et al. (US 5,755,913).

Regarding claims 1 and 7, Liaw et al. teach a method of bonding two polymer surfaces wherein, for example, polyimide films (col. 4, lines 8) are contacted with a vinyl monomer for graft polymerization (col. 3, lines 45-50; col. 5, lines 24-40). The films are contacted with the monomeric material and are washed and dried (Example 1). The surfaces are brought together and the chains entangle to bond the materials (col. 3, lines 38-50).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 7, 8, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peters et al. (US 7,238,246) in view of O'Connor et al. (US 6,919,046).

Regarding claims 1, 2, 7, 8, 22 and 23, Peters et al. teach a method of producing a flush connection between parts in the manufacture of a microfluidic device (Abstract; col. 1, lines 7-10; col. 4, lines 35-40) wherein first and second thermoplastic workpieces are provided (Figures 1-5; col. 3, lines 54-56; col. 4, lines 22-28). Either one or both of the connecting surfaces of the workpieces are contacted with a polymerizable material/swelling agent (col. 3, lines 45-52; col. 3, line 56-col. 4, line 8). The polymerizable material diffuses into the surface of the workpieces to form a diffusion layer (col. 3, lines 1-2). The workpieces are brought together under pressure and heated for a period of time intrinsically causing the swelling agent to react and join across the surface. The workpieces are conditioned in an oven. In this conditioning stage, the material is heated/dried and excess polymerizable/swelling agent is expelled/removed from the surfaces of the article and the bond is further strengthened (col. 3, lines 30-45; Example 1). Peters et al. generally recite the materials may be plastic and provide a few examples of suitable polymers (col. 3, lines 54-56), such as polycarbonate and polyether sulfone, but do not recite the polymers are the claimed polymers.

However, O'Connor et al. teach a method of producing a microfluidic device wherein the plastic materials are chosen, as required, to produce a device having the required properties.

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O'Connor et al. teach the plastics may be polyphenylene oxides, polyimides, polycarbonates, polyether sulfones, and various others (col. 6, lines 14-47).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Peters et al. and to have employed the plastic materials suggested by O'Connor et al., including materials such as polyimides and polyphenylene oxides, since O'Connor et al. suggest such materials are equivalent alternative materials known to be suitable in the art for forming microfluidic devices and for the purpose, as suggested by O'Connor et al., of achieving a microfluidic device having desired, "tuned", properties.

Claims 5, 6, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peters et al. (US 7,238,246) in view of O'Connor et al. (US 6,919,046), as applied to claims 1, 2, 7, 8, 22 and 23 above, in view of White et al. (US 4,824,500) and/or Penco et al (US 5,171,761).

As to claims 5, 6, 25 and 26, the combination teaches the method set forth above. Peters et al. do not teach employment of styrene and divinylbenzene as claimed. However, White et al. (col. 5, lines 40-57; col. 8, lines 8-14) and Penco et al. (Abstract; Examples) teach a method of employing styrene and divinylbenzene to facilitate improvement in bonding or physical properties of polymers.

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Peters et al. and to have bonded polyphenylenes with styrene and divinylbenzene since Penco et al. suggest styrene and divinylbenzene are compatible with polyphenylene materials

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Claims 11 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peters et al. (US 7,238,246) in view of O'Connor et al. (US 6,919,046), as applied to claims 1, 2, 7, 8, 22 and 23 above, in view of either of Jones et al. (US 7,025,935) or Miyake et al. (US 5,942,320).

As to claims 11 and 27, the combination teaches the method set forth above. Peters et al. do not teach bonding polyphenylene with polyetherimide. However, Jones et al. (col. 9, line 48-col. 10, line 5) and Miyake et al. teach that polyphenylene and polyetherimides are known equivalents in the art and Peters et al. teach bonding the same or different materials with styrene.

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Peters et al. and to have bonded polyphenylene and polyetherimide since Jones et al. and Miyake et al. suggest these materials are equivalent alternative materials known in the art.

Claims 2, 8, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liaw et al. (US 5,755,913), as applied to claims 1 and 7 above, in view of Gandhi et al (US 6,123,798).

As to claims 2, 8, 22 and 23, Liaw et al. teach the method set forth above, but do not teach forming a microstructured device. However, Gandhi et al. teach a method of bonding materials for forming a microstructured device (Abstract; col. 7, lines 2-14).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have combined the teaching of Gandhi et al. and Liaw et al. and to have formed a microstructured device with Liaw et al's bonding process, for the purpose,

of producing a microstructured device while eliminating the problem of adhesive getting into the channels (Gandhi et al: col. 7, lines 2-14).

Response to Arguments

Applicant's arguments filed March 24, 2008 have been fully considered, but are moot in view of the new grounds of rejection necessitated by the amendment to the claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY WOLLSCHLAGER whose telephone number is (571)272-8937. The examiner can normally be reached on Monday - Thursday 6:45 - 4:15, alternating Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. W./
Examiner, Art Unit 1791

June 17, 2008

/Monica A Huson/
Primary Examiner, Art Unit 1791